

Application No.: 10/774,598Docket No.: 4459-090AREMARKS

Applicants appreciate the Examiner's thorough review of the present application, and respectfully request reconsideration in light of the preceding amendments and the following remarks.

Claims 6-25 are pending in the application. Claim 6 has been amended only to improve claim language without otherwise touching the merits. Claims 9-25 have been added to provide Applicants with the scope of protection to which they are believed entitled. No new matter has been introduced through the foregoing amendments.

The anticipatory rejection of claims 6-8 is traversed because the applied reference, i.e., *Hsieh*, fails to teach or disclose each and every element of the rejected claims.

In particular, *Hsieh* discloses a method and an assembly for testing solder joint fractures between integrated circuit package and printed circuit board. Although all of the plurality of contact pads 215 can be divided into plurality of groups of which each group is arranged in a line, **each group of the contact pads 215 and the corresponding contact pads 125 does not form one closed circuit** through all of the bond wire 205, the solder balls 126 and the conductive lines 220 when one pair of the intermediated test pads 311 to 315 are probed, shown in FIGS. 4, 5 and 7.

However, the instant invention is characterized in that all of second contact pads are divided into a plurality of groups such that all of the second contact pads in the same group are arranged in a line and **each group of the second contact pads and the corresponding connected first contact pads form one closed circuit** through all of the first conductors, the solder bumps and the second conductors. Claim 6 of the instant invention recites that all of the plurality of second contact pads 310 can be divided into the plurality of groups (e.g. GROUP I shown in FIG. 3) such that all of the second contact pads 310 in the same group are arranged in a

Application No.: 10/774,598Docket No.: 4459-090A

line and only one of said groups of the second contact pads 310 and the corresponding connected first contact pads 210 form another closed circuit through all of the solder bumps therebetween when one pair of the minor test pads are probed. It is noted that, in the test board 300 according to one preferred embodiment of the present invention, all of the second contact pads in any group are arranged in a line. Since the grinding operation must be conducted from outer rows to inner rows, the time for conducting the scanning electron microscope (SEM) failure analysis is significantly reduced when the package substrate and the test board of the present invention are used.

Accordingly, Claim 6 is not anticipated by the cited reference of *Hsieh* and is clearly patentable over the cited reference of *Hsieh*.

Claims 7 and 8 depend from Claim 6, and are considered patentable at least for the reason advanced with respect to Claim 6.

New claims 9-12 are further patentable over *Hsieh* because the reference fails to disclose, teach or suggest that all of the second contact pads in the same group are arranged in a straight line, as now recited in claim 9.

New claims 13-14 are further patentable over *Hsieh* because the reference fails to disclose, teach or suggest the claimed spiral section. Note, the allowed claims of the parent application.

New independent claim 15 is patentable over *Hsieh* because the reference fails to disclose, teach or suggest the claimed test board in which all of the contact pads and all of the associated conductors in the same group are arranged in a straight line, and the contact pads at the ends of said straight line are connected to one pair of said minor test pads, respectively.

Claims 16-18 depend from claim 15, and are considered patentable at least for the reason advanced with respect to claim 15.

Application No.: 10/774,598**Docket No.: 4459-090A**

New independent claim 19 is patentable over *Hsieh* because the reference fails to disclose, teach or suggest the claimed test assembly in which all of the second contact pads and all of the associated second conductors in the same group are arranged in a straight line, and the second contact pads at the ends of said straight line are connected to one pair of said minor test pads, respectively.

Claims 20-25 depend from claim 19, and are considered patentable at least for the reason advanced with respect to claim 19.

Each of the Examiner's rejections has been traversed. Accordingly, Applicants respectfully submit that all claims are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.


The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

Application No.: 10/774,598Docket No.: 4459-090A

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

LOWE HAUPTMAN GILMAN & BERNER, LLP


Benjamin J. Hauptman
Registration No. 29,310

USPTO Customer No. 22429
1700 Diagonal Road, Suite 310
Alexandria, VA 22314
(703) 684-1111 BJH/KL/klb
(703) 518-5499 Facsimile
Date: September 2, 2004

CERTIFICATION OF FACSIMILE TRANSMISSION
I HEREBY CERTIFY THAT THIS PAPER IS BEING FACSIMILE TRANSMITTED
TO THE PATENT AND TRADEMARK OFFICE ON THE DATE SHOWN BELOW


TYPE OR PRINT NAME OF PERSON SIGNING CERTIFICATION

SIGNATURE

September 2, 2004
DATE

703-872-9306
FACSIMILE NUMBER